

W-band Assessment Agenda



- **Material from TMOT mid-year review (Teitelbaum)**
- **W-band receiver status (Seiffert)**
- **Initial Raster scan results (Rochblatt)**
- **Task plan review and re-planning (all)**

W-band Assessment Task Plan Summary



- **Phase-stabilizing the W-band receiver**
- **Completing development of computer-controlled noise temperature calibration instrumentation**
- **Optimizing the noise temperature performance of the W-band receiver on the telescope**
- **Assessing the W-band pointing capability with point sources using the existing radio astronomy and antenna calibration toolkit**
- **Measuring the aperture efficiency as a function of azimuth and elevation**
- **Applying the raster scan methodology to characterize the RF beam at W-band and to develop improved blind-pointing models. The raster scan will be studied systematically at X-, Ku- and W-band with the goal of understanding tradeoffs as a function of frequency and optimizing the technique for W-band (and Ka-band).**
- **Assessing the capability of the DSS-13 antenna servo system to support precise W-band tracking**
- **Reviewing existing W-band telecommunication literature in light of DSS-13 capability and other new technology**
- **Performing an updated W-band link analysis**
- **Studying the feasibility, cost, and required equipment of a laboratory demonstration of a W-band 10 Gbit/second data link**

W-band Assessment Deliverables (and schedule)



- **Routinely operational, calibrated radiometry-capable, VLBI-ready, noise temperature-optimized W-band receiver (end of Q2)**
- **W-band blind-pointing capability - preliminary results (end of Q2), mature pointing model (end of Q3)**
- **Memorandum documenting results from W-band link analysis (end of Q2)**
- **W-band aperture efficiency measurement (end of Q3)**
- **Memorandum documenting results of servo system assessment (end of Q3)**
- **Results from application of the raster scan technique at DSS-13**
 - **X-band and Ku-band preliminary results (end of Q3), W-band demonstration and results from systematic study (end of Q4)**
- **W-band fringe detection from single-baseline VLBI engineering test (end of Q4)**
- **Memorandum documenting results from 10 Gbit/second laboratory demonstration feasibility study (end of Q4)**

W-band Assessment Q3 High Priority Tasks



- **Receiver development**
 - Repair receiver, add first lo-stage phase lock, and return to DSS-13
 - Measure phase stability?
 - Decide on noise diode approach and implement
- **Pointing and Efficiency**
 - Detect point sources
 - Develop a “detectable” point source catalog
 - Apply open-loop conscan technique to detectable point sources
 - Obtain initial first and second order systematic error models
 - Measure residuals with respect to SEMODs
 - Complete aperture efficiency measurement as a function of elevation
 - Acquire data for antenna servo system assessment
 - Perform initial raster scan measurements at X-band
- **Telecommunications**
 - Perform updated W-band link margin study
 - Decision point: 10 Gbit/sec data link feasibility study - in or out?